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NATIONAL PHOTOGRAPHIC  
INTERPRETATION CENTER

**PHOTOGRAPHIC  
INTERPRETATION  
REPORT**

**PROBABLE HYBRID ROCKET  
ENGINE TEST POSITION  
UFA ROCKET ENGINE TEST FACILITY  
USSR**

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**AUGUST 1973**

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INSTALLATION OR ACTIVITY NAME		COUNTRY	
Ufa Rocket Engine Test Facility		UR	
UTM COORDINATES	GEOGRAPHIC COORDINATES		
NA	54-59-05N 056-04-20E		
MAP REFERENCE			
ACIC. USATC, Series 200, Sheet 0165-10, scale 1:200,000			
		NEGATION DATE (if required)	
		NA	

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1. A small probable hybrid engine test position was identified at Ufa Rocket Engine Test Facility, USSR, on photography [redacted] (Figures 1 and 2). The identification of the new test position provides the first indication that the Soviet Union's probable hybrid rocket engine program has moved from the research and development stage to one of acceptance testing.

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2. Ufa Rocket Engine Test Facility, which consists primarily of a large horizontal test building with four firing positions, was apparently complete and operational when first observed in April 1962. The test facility has probably been engaged in the testing of SA-2 and SS-N-2 sustainer engines for Ufa Aircraft Engine Plant B26 [redacted], which is approximately 10 nautical miles south of the test facility.<sup>1</sup>

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3. The new test position, constructed in the center of the blast apron for the large horizontal test building, represents the first major change at this facility since 1962. Initial construction activity for the new position was observed in the form of a small irregular excavation in the blast apron on photography [redacted] the excavation, then rectangular in shape, had been enlarged and [redacted]. The excavation was probably prepared for filling with reinforced concrete, which would provide a more stable base for the engine test firing block. In addition, eight holes for the vertical supports of the environmental shelter had been excavated.

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4. [redacted] the supporting framework for the shelter was complete and [redacted]. A probable firing block, which could not be measured due to limited interpretability, was observed between the four center posts of the framework. In addition, a pipe gallery connected the new position to the probable instrumentation bay of the large horizontal test building. The roof of the shelter, which covered approximately two-thirds of the test position, [redacted]

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5. When the new test position was next observed on photography [REDACTED]  
[REDACTED], a small light-toned object was visible beneath the open  
portion of the roof. When first observed, it was thought this object was prob-  
ably a propellant run tank and that the presence of this single tank, in addition  
to other common features, provided a strong comparison with a slightly larger  
but similar test position at the Primorsk Rocket Engine Test Facility [REDACTED]  
[REDACTED] The test position at Primorsk is probably used for research and devel-  
opment testing of hybrid propulsion systems.

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6. Because in a typical hybrid rocket engine only the oxidizer is liquid and the fuel an inert solid, the importance of what was thought to be a single propellant run tank was readily apparent. However, a subsequent study of other photography of poorer interpretability from the same mission obtained on [redacted] revealed that only a portion of the object thought to be a propellant tank had been observed [redacted]. Figure 2 shows a sketch of the object in its entirety as observed on [redacted]. It appeared to be resting on the probable firing block in the same position as the object seen [redacted]. It

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roof. Because of its size, configuration, and location within the test position,

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the object is now believed to be a probable hybrid rocket engine (containing the inert solid and thrust chambers) rather than a probable propellant run tank.

7. The fact that the probable engine remained in place [redacted] suggests a "battleship" engine may have been used to assess performance characteristics of components of the new test position before beginning a test program involving production line engines. A "battleship" engine is a specially constructed reusable engine which can be used for repeated test firings following replacement after each test of components such as fuel grains, igniters, and nozzles. Although the absence of a single tank containing the oxidizer would seem to detract from the identification of this new test position as being hybrid associated, it is possible that the oxidizer is supplied to the engine through one of the pipes which connects it to the large horizontal test building. It is also possible that the position is not yet operational and that a tank has yet to be installed. In any case, even though the absence of a propellant run tank and the presence of a probable hybrid rocket engine are features which are not comparable with the test position at Primorsk, the other similarities, including the environmental shelter, probable firing block, and pipe gallery, provide sufficiently strong indicators to retain the identification of a probable hybrid rocket engine test position.

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8. In view of past history of this facility as an acceptance testing rather than a research and development facility, the presence of this new test position suggests hybrid rocket engines have now moved into the production phase.

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## REFERENCES

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### MAPS OR CHARTS

ACIC. USATC, Series 200, Sheet 0165-10, scale 1: 200,000

### DOCUMENT

1. DIA. Foreign Missile Production (Communist World), DI-410-3A-72-SSO,  
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### REQUIREMENT

Project 143382NK

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